Name Period Date

SECTION 11.2

NATURAL SELECTION IN POPULATIONS

Reinforcement

KEY CONCEPT Populations, not individuals, evolve.

The phenotypes for a certain trait in a population can be graphed in what is called a phenotypic distribution. In this type of graph, you can see the range of phenotypes present in the population. You can also see how common each of these phenotypes is in the population, as measured by its frequency.

For a trait that is not undergoing natural selection, the intermediate phenotype is the most common phenotype in the population, while the extreme phenotypes are less common. A frequency distribution for this type of trait looks like a bell-shaped curve. A type of distribution in which the frequency is highest near the mean and decreases toward each extreme is called a **normal distribution.**

Natural selection can cause a phenotypic distribution to change in one of three ways:

- **Directional selection** favors phenotypes at one extreme of a trait's range. This type of selection causes the entire bell-shaped curve to shift in one direction or the other, toward the phenotype that is advantageous. During directional selection, the mean (or average) phenotype changes.
- **Stabilizing selection** favors intermediate phenotypes, selecting against phenotypes at both extremes of a trait's range. This type of selection causes the peak of the bell-shaped curve to become taller and more narrow (more "stable"), since the intermediate phenotype is becoming more and more common in the population.
- **Disruptive selection** favors phenotypes at both extreme's of a trait's range, selecting against intermediate phenotypes. This type of selection disrupts the distribution by causing a "dip" in the center of the bell-shaped curve, since the intermediate phenotype is becoming less and less common in the population.

1. What is shown in a phenotypic distribution?

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2. In what type of situation does a phenotypic distribution look like a bell-shaped curve?

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3. What is a normal distribution?

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4. Name and describe the three ways in which natural selection can change the distribution of a trait.

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